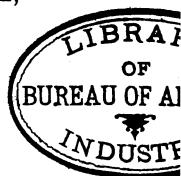


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U. S. DEPARTMENT OF AGRICULTURE,
'BUREAU OF ANIMAL INDUSTRY—Circular' No. 81.

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THE SHEEP INDUSTRY
OF
ENGLAND, SCOTLAND, IRELAND,
AND FRANCE.

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[Reprint from Bulletin No. 77, Bureau of Animal Industry.]



WASHINGTON:
GOVERNMENT PRINTING OFFICE.

1905.

PART II.—SHEEP.

SHEEP FEEDING AND MANAGEMENT IN ENGLAND.

Sheep are raised in all parts of England regardless of the quality or rent of the land, and the greater part of the feed used is produced on the farms. In the southern and central parts of the country more use is made of pasture and forage crops for fall and winter grazing than is possible in northern England, where feeding must be done under cover. In some parts of the country forage crops are used during the summer and fall to supplement pasture, and cotton-seed and linseed cake are very generally fed at this time.

BREEDING SHEEP.

FEEDING THE RAM.

The feeding and management of the ram during the breeding season varies according to the time of the year, the condition of the ram, and the methods of handling him during the mating season.

Dorset breeders turn the rams with the ewes in June; with other breeds the usual season is from September 1 to October 20. To produce show lambs some breed in August, and some Hampshire and Suffolk breeders breed all their ewes during this month.

The ram may be allowed to run with the ewes (a quite common practice); he may be housed during the day and allowed to run with them at night, or the ewes may be brought to him for service. Rams which are carrying an unusual amount of flesh are always "conditioned" for a few weeks before being used by being given regular and abundant exercise and very light rations. In addition, the best breeders usually give one or two doses of Epsom salts.

Rams which run with the ewes usually receive about 1 pound per day of a mixture of bran and oats. Feeds rich in protein are used, and starchy feeds or those rich in oil avoided, as they are inclined to heat the system and produce flabby flesh. Rams which are housed during the day and allowed to run with the ewes at night are nearly always fed green feed, and from $\frac{3}{4}$ to 1 pound of oats and bran. When a ram stands for service the best breeders prefer giving him the run of a grass lot at night for exercise. Rams are liberally

fed during the breeding season, but are never kept fat or in a soft, flabby condition. At other seasons of the year than mating time grass, forage, and root crops are used, and as much feeding as possible is done out of doors; regular exercise is regarded as necessary.

As soon as the breeding season is over the rams are separated from the rest of the flock and given a small grass lot of their own. Young rams, or mature ones which have done a heavy season's service, are usually given from $\frac{1}{2}$ to $1\frac{1}{2}$ pounds of grain per day, depending on age and condition. As winter comes on the rams are kept on pasture as much as possible.

In the northern part of the country rams are kept out of doors a great deal, but the feeding is more liberal. Mangels are very seldom fed to rams, turnips being the chief source of succulent feed. During spring and summer rams are at pasture the greater portion of the time, but have green forage as needed in addition to grass. Grain is fed on some farms just before the breeding season.

CONDITIONING THE EWES FOR MATING.

A great deal of attention is given to the proper conditioning of the ewe previous to mating her with the ram, and practically all successful breeders "flush" their ewes for a few weeks before mating. This is done by increasing the feed. Ewes so treated will take the ram sooner than others, which is a decided advantage on those farms where early lambs are desired, and the entire number of ewes will come in heat within a shorter period, thus enabling the owner to have all of his lambs dropped within a few weeks' time, a factor which is often very beneficial when they are to be marketed. Furthermore, on account of the increase in vigor and condition of the ewes, a larger percentage of lambs is obtained and they are much stronger.

Various feeds are used, and for convenience the discussion is arranged according to breeds.

DORSETS.—A successful breeder in Dorset, who is also an exhibitor and exporter, gives his ewes about $\frac{1}{2}$ pound per head per day of either corn or beans. They are mated in June.

HAMPSHIRE.—A most successful Wiltshire breeder of Hampshires uses cabbage, rape, and a small allowance of linseed cake for about two weeks previous to mating. His ewes are turned with the ram about the 7th of August.

LEICESTERS.—A successful breeder in Yorkshire uses good pasture or folds his ewes on thousand-headed kale, rape, or cabbage.

LINCOLNS.—A Lincolnshire breeder who has a most enviable reputation as a breeder of high-class sheep for show and export uses clover aftermath, kale, or rape.

OXFORDS.—A leading breeder and exhibitor in Oxford grazes his

ewes on second-crop clover for about two weeks previous to turning them with the ram.

SHROPSHIRE.—One of the most successful breeders in Shropshire folds his ewes on rape and turnips.

SUFFOLKS.—A prominent Suffolk breeder gives his ewes the best pastures on the farm and in addition folds them on rape, cabbage, kale, mustard, or any other green feed available.

WENSLEYDALES.—A successful breeder in Yorkshire uses rape or barley stubble which has been seeded to clover.

The flushing system has some disadvantages. Inducing the ewes to take the ram earlier than they otherwise would has a decided tendency to make them return for a second or third service, and in some instances they will not become pregnant at all. This is caused by the change in the methods of feeding, and it proved very troublesome at one time, but has finally been overcome. After some experimenting shepherds found that if kept on a rather scanty ration after breeding the ewes will settle, as a rule, with the first service. The majority of breeders smear the breast of the ram with some retentive color which marks each ewe as soon as bred, and she may then be removed from the flock. The short rations are maintained for about a month. As a safeguard, all ewes are returned to the ram about the time the second heat is due.

FEEDING THE PREGNANT EWE.

The methods of feeding the pregnant ewe up to within about three weeks of lambing show rather surprising diversity, especially as to the use of roots. Some men deem it a most dangerous practice to feed roots to ewes, especially during the last three months of gestation, while others who are equally successful even fold pregnant ewes on turnips, the regular exercise probably overcoming the troublesome effects of the feed.

Practically all breeders graze ewes at all times when the weather is favorable. Ewes in good condition seldom get any grain or cake until a couple of weeks before lambing. Thin ewes are generally separated from the remainder of the flock and given one-half pound of grain per head daily. The following brief outline conveys a general idea of the management of the ewes at this time.

An unusually successful Dorset breeder allows his ewes to run on pasture until September, when they are folded on cabbage and fed plenty of good clover hay.

A noted breeder of Hampshires allows his ewes the run of stubble fields and grass land during the day and folds them on turnips at night. From the middle of November till the first of December they are out four or five hours each day on grass and are folded in a dry lot, where they are fed clover hay twice each day.

A noted breeder of Leicesters simply pastures his ewes. As winter comes on they receive in addition a small allowance of roots, generally turnips, and a liberal allowance of cut sheaf oats.

A famous breeder of Lincoln sheep allows his ewes the run of a grass lot up to the first of December. He then puts them on turnips until about three weeks before lambing. While on turnips they get cut clover hay, oats, and linseed cake in addition. They are fed what hay they will eat up clean and from one-half to 1 pound of grain per head per day.

A well-known Oxford breeder divides his ewes into flocks of about thirty in each, and allows them the run of the pasture lots with frequent changes. In open weather no additional feed is given. This breeder does not use any turnips or other roots until a few days before the lambs are expected.

A successful breeder of Shropshire sheep allows his ewes the run of a grass lot and a liberal allowance of dry feed in addition. They are given all the clover hay they will eat and about two-thirds of a pound per head daily of a mixture of oats and bran. He is a strong advocate of feeding plenty of dry feed but no roots until the lambs arrive.

A breeder of Suffolks uses grass, and in addition folds the ewes for a few hours each day on rape, cabbage, kale, or mustard up to about the 20th of October. After that they are allowed the run of stubble fields and grass land during the day and are folded on cabbage at night; this is followed by folding on white turnips and giving several hours each day on grass and stubble.

FEEDING THE EWES AT LAMBING TIME.

The methods used at this time are very much the same on all sheep farms, whether breeding stock or market mutton is the object. Hay is usually cut or chaffed. From 8 to 18 pounds of roots per head are given daily. Common grain rations are: Equal parts by weight of oats, bran, and linseed cake; one part oats, one part bran, and two parts linseed cake, or equal parts of cotton cake and oats. The amount fed varies from one-half pound to 1 or 1½ pounds per ewe per day.

FEEDING THE EWES AND LAMBS BEFORE WEANING.

Ewes suckling lambs have liberal rations of grain and cake and abundant forage on temporary pasture, so that as little risk as possible is run by the lambs contracting parasitic troubles. As is well known, one means to combat stomach worms is to keep lambs off old pastures. On many farms the ewes are divided, those with twin lambs being placed in one lot and those with singles in another, ewes with twin lambs being fed more heavily.

A brief outline of methods of feeding is given below:

A breeder of Dorset sheep who produces October lambs, the majority of which are marketed for the Christmas trade, feeds as follows: Ewes with twin lambs get 2 pounds per head per day and ewes with single lambs 1 pound of a mixture of equal parts by weight of oats and cotton cake, in addition to grass and green forage. As soon as they will eat, the lambs are fed a mixture of oats, bran, and linseed cake, equal parts by weight, and are finished off with beans or peas and linseed cake. The amount fed depends on what the lambs will eat, commencing with about one-eighth of a pound per lamb per day and finishing with from three-quarters pound to 1 pound or more. The finishing feed is given during the last three or four weeks previous to marketing.

A breeder of Leicesters gives his ewes a mixture of linseed cake, cracked peas, bran, and dried brewers' grains. Ewes with single lambs get three-fourths pound per ewe per day of the mixture, while those with twin lambs get $1\frac{1}{4}$ pounds per ewe per day. All of his lambs are fed a small allowance, seldom exceeding one-half pound per day, of a mixture of equal parts linseed cake, cracked corn, and crushed oats.

A noted Lincoln breeder gives his ewes no other feed than soiling crops and pasture. Single lambs are not fed any concentrated feed, but all twin lambs receive a daily allowance of oats and linseed cake.

A prominent breeder of Suffolk sheep feeds his ewes with single lambs three-quarters of a pound of a mixture of equal parts of oats, linseed cake, and bran per ewe per day, and his ewes with twin lambs 1 pound per ewe per day of the same mixture. His ewes are divided; those with single lambs have no additional feed, but all with twins have grain feed from the time the lambs are $2\frac{1}{2}$ weeks old.

Some breeders of purebred sheep divide the ram and ewe lambs when a few weeks old and feed liberally on grain. On some farms all ewe lambs intended for breeding purposes are fed very sparingly on grain, only oats and bran being given, especially when they are to be retained on the farm. At weaning time the grain rations are withheld from the ewes, and they are placed on a short pasture. This is done for the twofold purpose of drying off the milk and also to keep them in a moderate condition until it is time to prepare them for the mating season. They are taken from the short-grass lot and fed on such rations as have been previously described for "conditioning" ewes.

FEEDING THE LAMBS AFTER WEANING.

Lambs are weaned at the age of 3 or 4 months, and the greatest care is taken to prevent any setback or standstill at this time. The

general tendency is to wean as early as possible, so that if the ewes are on permanent pastures the lambs can be taken away before parasites make themselves known. Breeders usually have some choice green feed at this time, so that the growth of the lambs will not be retarded. When the weaning season occurs about the same time that the grain fields are being cleared of their crops, many farmers run the lambs on the stubble fields, with green feed and grain in addition. Frequent changes of grazing ground are desired.

Although some men fold their lambs on green feed, the practice is not a good one in the opinion of the most successful breeders. This is especially true where they are folded on small areas at a time, as they then do not get sufficient exercise and take on fat too rapidly. The most highly commended practice is to allow the lambs the run of the stubble fields the greater portion of the day, with but a few hours in the forage lot, or to cut a small amount of forage from time to time and give the lambs free access to it from the stubble fields.

One of the first things done at weaning time is to divide the lambs into two or three bunches. Wether lambs, or ewe lambs not fit for breeding, are separated and put in a bunch by themselves and given different feed from those intended for breeding purposes. Rams and ewe lambs intended for breeding are separated, the rams to be more liberally fed than the ewes.

Many breeders sell their ram lambs in the fall of the year, but others prefer keeping them over and selling them as yearlings. Those intended for immediate sale are, as a rule, given better care and feed than those to be carried over the winter.

The following illustrates the methods of feeding from weaning time until the following spring:

A breeder of Hampshires who weans his lambs about June 1, when they are 4 months old, folds his ram lambs on vetches and sainfoin each day during June, in addition to giving them the run of a grass lot which has not been previously pastured with sheep, and a grain ration of oats, bran, and linseed cake. During July and the early part of August, until sale time, they are folded on cabbage and rape, with about 1 pound of grain. The ewe lambs are folded on vetches, cabbages, and rape, with no grain, unless the green feed is scarce, when one-third or one-half pound per day is given. From September until the 1st of May they are folded on turnips, swedes, and kale, with one-half pound per day of grain and straw, chaff, or clover hay.

A famous breeder of Lincoln sheep advocates liberal feeding and very frequent changes of pasture for lambs from weaning time until the following spring. He divides his lambs according to sex, but feeds all alike. The principal feeds used are green clover, tares, rape, and turnips. During the fall and winter they are folded on

turnips and fed all they will eat up clean of cut clover hay, in which is mixed about one-half pound per head per day of linseed cake.

A Shropshire breeder feeds as follows: At weaning time, which is about the 1st of June, when the lambs are 3 months old, they are divided into two flocks, the rams in one and the ewes in the other, and are given the best green crops available. Vetches are preferred, then clover, rape, kale, cabbages, early turnips, and swedes, in the order named. The lambs are always allowed the run of a new grass lot during the day for several hours, and when the crops are harvested they are changed to the stubble fields. When old mangels are available they are given for a few weeks, sliced. Some grain is fed, about one-eighth of a pound per day at the beginning and gradually increased so that when the lambs are 6 months old they are eating about one-half pound each per day. During the fall and winter they are pastured on turnips and have the same grain allowance, with as much good clover hay as they will eat at all times. This man always keeps rock salt in the troughs and sprinkles about one pound per day of common salt on the feed of each 75 lambs.

A breeder of Suffolk sheep who weans his lambs about the middle of June, when they are $4\frac{1}{2}$ months old, feeds as follows: The ram lambs are separated from the ewes and fed on white clover, cabbages, rape, and kohl-rabi, cut and fed in troughs. In addition they have from one-half to 1 pound each of grain per day, the object being to push them along rapidly so that they will be of a good size at sale time, in August and September. The ewe lambs are put on trifolium and vetches, which are followed by rape, mustard, and cabbages, with the run of the stubble fields when ready. If in good condition no grain allowance is given, but if not, about one-third of a pound per day is fed. During the fall and winter they are fed on white turnips and swedes, with about one-half pound per head daily of grain and a liberal allowance of pea straw or clover hay. When the turnip supply is not sufficient, cut mangels are given in the spring.

The methods of feeding practiced on other farms are very similar to the foregoing. Green feed is always given during the summer and fall until the turnip crop is ready, then the turnips are the chief feed, with some form of roughage, usually clover hay, and a small allowance of grain and cake, which in nearly every instance is a mixture of oats, wheat, bran, and linseed cake.

FATTENING LAMBS FOR MARKET.

In the feeding and fattening of lambs for market rather distinct methods are pursued. Those who rear early lambs aim to grow them rapidly, so that they will be ready for market in June or the early part of July. The advantages claimed for this method are that it

yields quick returns, that the lambs are sold before parasites become troublesome, and that it gives an opportunity to purchase a bunch of sheep or lambs for fall feeding, thus increasing the sheep-carrying capacity of the farm and bringing in larger returns. Those who prefer late lambs believe that they do not require the same amount of attention as early lambs, that the ewes do not need so much special feeding, that warm sheds are not a necessity, and that the lambs can utilize the waste of the farm during the summer and fall, especially that of the stubble fields. Where late lambs are reared much care is necessary during the summer months, and old pastures must not be used as grazing grounds, as in them parasites are almost sure to attack the flock and cause serious losses.

In rearing early lambs the mothers are very liberally fed on clover hay, grain, and succulent feed. The amount of roots fed is surprising, in some instances as much as 20 pounds per ewe per day, but from 10 to 15 pounds daily is considered very liberal feeding. Winter rye, winter barley, and kale are utilized before the grass comes. The lambs are taught to eat grain at a very early age, most of them eating well at three or four weeks. Special lamb pens, or feeding creeps, are provided for this purpose. In some instances a self-feeder is used, but the majority of farmers prefer such feed fresh every day. The amount of grain fed is gradually increased until the lambs are eating from three-fourths to $1\frac{1}{4}$ pounds each per day, at three or three and a half months of age. This method of feeding is maintained even when the grass is abundant. The lambs are marketed when from 3 to 4 months old, weighing from 60 to 100 pounds each.

The more prevalent custom in feeding late lambs is to withhold all grain and utilize the pastures and stubble fields, with perhaps some green crops in emergencies, until after weaning time, which occurs in September. At that time lambs are generally folded on rape, kale, cabbage, or more often turnips. While close folding is not deemed advisable in the case of lambs intended for breeding, it is admirably suited to fattening purposes. In addition to the succulent feed supplied in the folds, the lambs are given a grain allowance of from three-fourths to $1\frac{1}{4}$ pounds each day. Cotton-seed or linseed cake or a combination of the two usually forms one-half to two-thirds of the concentrated feed. The remainder of the grain ration is oats, barley, beans, peas, or corn, depending on market prices. As a rule not much roughage is used in fattening lambs during the fall, but those who do furnish such feed use either clover hay or straw chaff. The chief reliance is placed on the use of green crops and roots, especially turnips.

FATTENING SHEEP.

The general tendency is to market lambs, but a considerable amount of sheep feeding still exists in all parts of the country. Some of these animals are natives, but a considerable number come from Ireland and Scotland, especially from the Scotch Highlands. The fall and winter methods of feeding are much the same as those practiced in lamb feeding. Folding on green crops or on the root crops is the general custom. In addition grain and cake are given to the extent of from 1 to 2 pounds per head per day. In some instances dried brewers' grains are fed with cake.

Where yard or shed feeding is practiced during the winter the ration usually consists of from three-fourths of a pound to 2 pounds per head per day of clover hay, mixed hay or straw chaff, from 12 to 20 pounds of roots, and from three-fourths to $1\frac{1}{2}$ or possibly 2 pounds of grain and cake. Some farmers fatten their sheep on grass alone, feeding in addition cotton-seed or linseed cake, or a combination of the two, to the extent of from 1 to $1\frac{1}{2}$ pounds per sheep per day.

SHEEP RAISING IN SCOTLAND.

Sheep, either as a specialty or as an important adjunct of the regular farming operations, are raised in all parts of Scotland. In the farming country, where the rent values are from \$5 to \$15 per acre, sheep are considered indispensable, as they not only generally give handsome returns in mutton and wool for the feed consumed and the labor expended, but they also increase the fertility of the soil. The Scotch farmer values sheep very highly as soil improvers. Although use of commercial fertilizers is very general in all parts of the country, the farmer who takes possession of a worn-out farm invariably resorts to sheep feeding as the surest and quickest method of enriching his land. On the hill and mountain land sheep are grown in large numbers. With high and well-drained land the conditions in Scotland are well suited to the production of sheep, as many parasitic troubles which so often cause heavy losses among the flocks of England are almost unknown in Scotland. The climatic conditions are favorable to the growing of roots, especially turnips, which form the basis of practically all sheep feeding. The fall and winter months are generally open and permit the grazing of the turnip crop, eliminating a great deal of labor in harvesting and saving the labor of handling the manure.

Sheep folded on turnips are always fed from $\frac{1}{2}$ to $1\frac{1}{4}$ pounds each per day of grain and cake, this feeding being relied upon to enrich the manure. The influence of sheep husbandry on the fertility of the soil is generally recognized as of sufficient value to compensate for

the labor expended and for one-third of the total cost of the grain and cake fed. In some sections of the country the terms of the lease entitle a farmer who is giving up a farm to reimbursement for one-third of the total cost of all cake fed on turnip ground during the year. The influence of sheep feeding on the soil is so great that many farmers claim that they can not afford to be without sheep, even if they were to lose money on the mutton and wool produced. Two and three year old wethers are considered the most valuable and in-lamb ewes the least valuable to improve soil fertility.

The tendency now is to use younger sheep in feeding than in former years. The lambs grown on the arable farms are nearly all marketed under one year of age, while in former years they were fattened as yearlings and two-year-olds. The hill and mountain sheep are also finding an earlier market. The change in the age of feeding sheep has been brought about by the demand of the retail dealers for smaller carcasses to supply smaller cuts. Furthermore, mutton from young sheep can be sold at once, as it does not require several weeks to ripen, as is the case of that from two and three year old wethers.

FEEDING PUREBRED FLOCKS.

In the management of purebred flocks Scotch farmers, as a class, use more simple methods than those of England, and there is not the same tendency to force young sheep. The lambing season is later, both on account of the colder climate and because the absence of danger from parasites obviates the necessity of getting lambs off the pastures early; March and April are the usual months. In the management of breeding flocks breeders give plenty of natural feed, out-of-door exercise, and fresh air.

FEEDING BREEDING RAMS.

During the breeding season most of the breeding rams are allowed to run with the ewes night and day, and as a rule they receive no other feed than that obtained in the grass lot. Young and growing rams or old thin ones are often given some additional feed. The feed used varies on different farms; in some instances a mixture of linseed cake, oats, and bran is given, while on other farms oats alone, or oats and cabbage, are fed; about 1 pound per head daily of the grain mixture is fed. Outside the breeding season rams are fed moderately. During fall and winter they are on good pasture when the weather is favorable, and are given hay (clover preferred) and turnips or cabbage. Up to the opening of the breeding season rams are allowed the run of a grass lot, with no additional feed.

FEEDING BREEDING EWES.

In the feeding of breeding ewes good care and feed are given just previous to and at lambing time. Breeders, especially those who breed Border Leicesters, do not as a rule flush their ewes to the same extent as English breeders. Those who handle the Down breeds give more attention to this point, using meadow aftermath, stubble, cabbage, rape, or grain. After the ewes are safe in lamb they are not given additional feed to that obtained on pasture until the winter, when the best breeders allow ewes the run of a grass lot, feeding hay and cabbage or turnips in addition, without grain, until two or three weeks previous to lambing time.

Where early lambs are produced the ewes are fed very liberal rations just before lambing, being given a daily ration of clover hay to the extent of $1\frac{1}{2}$ to 2 pounds, turnips 14 pounds, and from 1 to $1\frac{1}{2}$ pounds of a mixture of equal parts of linseed cake, crushed oats, and bran. In some instances dried brewers' grains are given with linseed cake instead of oats and bran on account of the lower cost. The heaviest grain rations are always given to the ewes with twin lambs. The lambs are also taught to eat oatmeal or rolled oats, to which some linseed cake is added later on. After grass has made a good start, neither ewes nor lambs are given grain and cake until weaning. Ewes which lamb during the latter part of March and early in April are usually given some grain and cake for a few weeks, especially if the grass is backward in growth.

After the lambs are weaned the ewes are usually put on short pasture until the flow of milk has completely stopped, and in many instances remain there until the next breeding season.

FEEDING THE LAMBS AFTER WEANING.

The majority of lambs are weaned during August and September. In some instances they are allowed to run together until the middle of October, when the rams and ewes are divided. On other farms this division is made at weaning time. Grain is fed to all lambs regardless of sex for five or six weeks after weaning, so that they may have a good start and not lose the flesh made while suckling.

The following methods prevail on the most successful farms:

A breeder of Border Leicesters weans his lambs in August. After weaning the lambs all run together until the middle of October, have a good grass lot, usually meadow aftermath, and receive about one-half pound each per day of oats and linseed cake. When the ewes and rams are separated the rams are put on cabbage or turnips and are carried in this way all winter, but the grain is increased to 1

pound or $1\frac{1}{2}$ pounds each per day. When the weather is open no hay is given, but in stormy weather or when snow is on the ground some clover hay or mixed hay is fed each day. The ewe lambs are allowed the run of a grass lot all fall and winter and have some turnips in addition fed on the grass. In some instances they are folded on a turnip patch for a few hours each day, but grain is never given. This breeder aims to have his rams well forward as shearlings at sale time, which is about the first of September. With the ewe lambs growth and a robust constitution are the points sought for.

On one of the largest and most successful Shropshire farms located in East Lothian, near Edinburgh, the manager weans his lambs during the first week in August, when the ewes and rams are separated. The ewes are put on second-crop clover until turnips are ready, when they are fed turnips on grass and have some hay in addition until the following spring. The ram lambs are better fed. They are grazed on second-growth clover, are fed cabbages or turnips, and have in addition from one-half to a pound of linseed cake and crushed oats each per day. During cold and stormy weather they are fed some clover hay.

PRODUCTION OF SHEEP ON THE HILLS AND MOUNTAINS.

In the south and southeast of Scotland the Cheviot is the popular hill sheep, while in the western, central, and northern portions of the country the hardy Black-faced Highland sheep is used. They furnish the chief source from which the farmers in the arable districts secure their feeding sheep.

The mountain and hill sheep are bred and grown for feeders, and the allowance of feed is only sufficient to maintain the older animals and furnish a rather scanty diet for growing ones. Therefore the sheep require considerable time to reach maturity. In former years they were practically all retained on the hills until $3\frac{1}{2}$ years of age. They are now generally sold between $2\frac{1}{2}$ and 3 years of age. Many of them are fed as lambs and are ready for the butcher before 9 months of age, and this system is growing in favor, but the great majority are sent down into the arable districts as lambs to be wintered, and are returned to the hills with the opening of spring, to be sold as feeders the following year. If it were not for this practice, yearling wethers would be fed generally, but the majority of hill sheepmen consider it too soon to send their sheep back in six months' time, and therefore retain them until $2\frac{1}{2}$ years of age before marketing.

In some instances the lambs sent to the arable farms in the fall are not returned to the hills the following spring, but are either sold for immediate feeding or are grazed during the succeeding winter and summer to be sold later as yearling store wethers.

Grass, shrubs, and heather furnish the feed throughout the various seasons of the year. The ewes drop their lambs about the latter part of April or early in May, by which time the weather is usually favorable and there is sufficient grass to insure a good supply of milk. Neither ewes nor lambs get any other feed than grass throughout the summer and fall, and at weaning time the lambs are sent down to the arable districts to be wintered, so that they are not compelled to endure the hardships of a Highland winter. All other sheep, as a rule, are grazed on the hills and mountains throughout the entire year. The average period of usefulness of the ewes is about five years. When 5 years old they are generally taken from the flock and sent to the arable districts, where they are fattened or, what is a more common and profitable practice, bred to a first-class mutton sire: In the latter case they rear one crop of lambs. Both ewes and lambs are fattened for the early summer market. Young ewes not needed for breeding purposes are sold in the fall to feeders or to Irish hill farmers, who breed them to high-class mutton sires to produce feeding sheep.

FATTENING FOR MARKET.

The feeding of sheep and lambs for market is the most important branch of the Scotch sheep industry. The great bulk of the work is done during the fall and winter. Many farmers feed at this time of the year who do not keep any sheep on their farms throughout the remainder of the year, especially where very intensive farming prevails. In such cases the sheep or lambs are folded on the turnip fields. Where the land is not so valuable and rents are low, many farmers keep a large portion of the land under grass and feed sheep during spring and summer. There are a great many farmers who breed practically all of their own feeders, but these men either have cheap grazing land or they raise early lambs, which are grain-fed from the time they will eat until marketed, and others raise one crop of lambs from cast-off hill ewes, as already mentioned.

PRODUCING LAMBS FOR EARLY SUMMER MARKET.

In certain parts of Scotland considerable attention is given to the production of lambs for the early summer market. Those farmers who are making a success of this have warm pens for the ewes and lambs, and give the ewes very liberal rations, and the lambs are fed grain and cake as soon as they will eat. The lambs are dropped during the latter part of January and February and are forced until May or June, when they are marketed. The ewes are fed from 1½ to 2 pounds each per day of clover hay, from 12 to 16 pounds of turnips, and from 1 to 1½ pounds of a mixture of wheat bran, crushed oats,

and linseed cake; the larger allowances are fed to those with twin lambs. The lambs are fed in creeps and are given all they will eat of oatmeal or rolled oats at first, and later on crushed oats, cracked corn, and either linseed or cotton-seed cake. Lambs at four weeks old will eat about an eighth of a pound each day, while at three months they will take from two-thirds to 1 pound each. When fed in this manner they make very rapid growth and are always well fleshed.

FATTENING HILL AND MOUNTAIN EWES AND LAMBS.

When hill and mountain ewes are bought to be bred to a mutton sire for one crop of lambs, they are bred to drop their lambs in March, and during pregnancy are given the run of grass or stubble land, with some turnips, so as to be in fair condition at lambing time. A few weeks previous to lambing they are fed oats and linseed cake, or brewers' grain and linseed cake. From lambing time they are fed well until marketed, the lambs having the same ration as soon as they are old enough to eat it. Grain and cake is given until grass is good, but after that time cake alone is fed, the amount varying from one-third to three-fourths of a pound per lamb per day, and from three-fourths pound to 1½ pounds per ewe per day. The lambs are marketed when from three to four months of age, and if ready the ewes go at the same time, but generally they require about four weeks more liberal feeding on cake to finish them.

FATTENING LAMBS FOR MARKET.

Lambs for fall and winter feeding are usually purchased in the month of September, or if home bred are weaned at this time. They are first given the run of the stubble land for a few weeks and are gradually taught to eat turnips, and later are folded on the turnip land. In addition, they are fed cut hay and a liberal allowance of grain and cake, largely cake. When the lambs are on common turnips many successful feeders feed cotton cake and dried brewers' grains, equal parts by weight, to the extent of from one-half to three-fourths pounds per lamb per day. Should the roots be changed to swede turnips the grain ration is changed to 2 parts linseed cake, 1 part cotton-seed cake, and 1 part dried brewers' grains. Swede turnips are thought by sheepmen to be more difficult to digest than common turnips, and the addition of linseed cake is supposed to assist digestion. The grain allowance is increased during the finishing period, and may be changed to eliminate the brewers' grains, but cake is practically always used as a part of the ration. Some farmers do not put their lambs on the turnip land so soon, but first graze them for two or three months.

FATTENING SHEEP FOR MARKET.

The fall and winter methods of fattening sheep are very similar to those described for lambs. They are usually folded on roots with a grain-and-hay ration in addition. Roots are usually sliced for sheep which are teething. The amount of hay and grain is not large, but as much as 25 pounds of roots per head are fed daily. Practically all feeding is done in the open.

On lighter land, when a considerable amount is set aside for grazing, sheep are fed during the spring and summer. Some farmers fatten their sheep on grass alone, but the large majority feed some concentrate in addition, cotton seed or linseed cake being generally used. Some good feeders use a small amount of bran in connection with it, while others feed equal parts cotton seed and linseed cake. The amount varies from three-fourths to 1½ pounds per head per day.

SHEEP PRODUCTION IN IRELAND.

With an abundance of grass and a temperate climate, the conditions of Ireland are very favorable to sheep raising. For years Irish farmers have given most attention to the production of sheep for feeding and the finishing of sheep on grass alone for market, but recently the breeding of purebred sheep and the fattening of sheep for mutton have increased, and this has resulted in the adoption of improved methods of feeding.

FEEDING PUREBRED FLOCKS.

The methods of feeding purebred sheep resemble those of England in some respects, but as a rule fewer forage crops are grown and a much more liberal use is made of grass, and smaller amounts of grain, hay, and succulent feeds are used. Throughout a great deal of the country grass alone in its season is the principal feed for breeding sheep.

THE PRODUCTION OF FEEDERS.

The production of feeding sheep is an important industry in Ireland. The tenant farmers, especially in the western and southern portions, grow some feeders each year, and although the number kept by each individual is generally small the total production is large. These sheep do not receive a great deal of care, but when the pastures are not too heavily stocked they do well. Winter feeding is not resorted to except in the case of a prolonged period of severe weather, which seldom happens.

In the mountains and hilly districts feeders are raised in a rather systematic manner. Large numbers of Black-faced Highland ewes

are annually purchased in Scotland and bred to high-class mutton sires. The Scotch ewes drop their lambs about the latter part of April or the first part of May, when the weather is warm and the grass abundant. They run on pasture at all seasons of the year, and are thus maintained very cheaply. The feeders are generally sold when $1\frac{1}{2}$ years old.

FATTENING SHEEP FOR MARKET.

In central Ireland the fattening of sheep for mutton is receiving considerable attention. On good land nothing but grass is given, but where the soil is not so good and the yield of grass per acre less some additional feed is usually supplied. The principles are practically the same as those of English feeders, smaller amounts usually being fed. One very successful ration is equal parts of cotton-seed cake, linseed cake, and cracked corn. The length of the feeding period varies from sixty to one hundred and fifty days, depending on the condition and age of the sheep and the condition of the markets.

THE SHEEP INDUSTRY OF FRANCE.

The sheep industry of France is quite extensively developed. The Merino, in some form, is bred for wool, and the British mutton breeds and their crosses on Merino ewes are used for mutton. These crossbred sheep generally show a strong inclination toward the Merino type, and in the opinion of the leading French farmers this quick reversion to the Merino type is due largely to the methods of feeding. When introduced into France, bred pure, and maintained in small flocks, with plenty of green feed and grain, the British breeds have done equally as well as in England, but under more adverse conditions they seem very soon to lose those characteristics which have won for them so much praise in the mother country.

In some parts of the country sheep are given rather scanty rations during the winter and are pastured during the milder seasons of the year. Where there are no fences they are confined in sheds and yards during the growing season. Some farmers yard their sheep at night and herd them during the day. The French farmers, as a rule, do not grow many special crops for their sheep. Clover and alfalfa hay and straw are fed during the winter, with grain or cake and roots when available. The spring, summer, and fall rations consist of grass, forage crops, cabbage, and roots.

During the breeding season the rams are allowed to run with the ewes and subsist on the same rations, or they are confined in sheds, where the ewes are brought to them for breeding. The latter method prevails on the best sheep farms, especially those of the French

Government, where Rambouillets are bred. When rams stand for service they are fed clover or alfalfa hay, roots or cabbages, and a liberal allowance of oats, bran, and linseed cake.

On a large number of farms, especially those where Merinos are maintained, the ewes are bred during August or the early part of September, during which time they are confined to their sheds or yards. No special feeding is done. Later in the season when they are safe in lamb and the fields are cleared of their crops they are given the run of the grass and stubble fields. Some farmers who are breeding Southdowns follow the English methods more closely, and provide roots and other succulent feed in large quantities.

As the lambing season approaches all ewes are fed more liberally. Lambs are not fed while suckling, except on farms where the English mutton breeds are raised.

Where grass is available it is the principal feed in fattening. Soiling crops are also utilized, and in some instances grain and cake are used during the summer; small grain rations are the rule. Considerable winter feeding is done, the rations used being very simple. Some feeders use a ration composed of 1 to 2 pounds of clover hay and 1 to 1½ pounds of a mixture of corn and wheat bran per head daily. Other rations fed by good feeders are as follows: Alfalfa hay, 2 pounds; corn, 1 pound, and linseed cake, one-half pound per sheep per day; mixed hay, 1½ pounds; oats, one-half pound; cottonseed cake, one-half pound, and wheat bran, one-half pound per sheep per day. As a rule the amount of roughage given is about 1½ pounds per sheep per day, while the grain ration varies from 1 to 2 pounds.